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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/670,955	09/25/2003	Daniel T. Colbert	11321-P011CD2D1	7093

7590 03/28/2006

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EXAMINER

FIORITO, JAMES

ART UNIT	PAPER NUMBER
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1754

DATE MAILED: 03/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/670,955

Applicant(s)

COLBERT ET AL.

Examiner

James A. Fiorito

Art Unit

1754

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 84-93 is/are pending in the application.
- 4a) Of the above claim(s) 87-90 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 84-86 and 91-93 is/are rejected.
- 7) ☒ Claim(s) 84 is/are objected to.
- 8) ☒ Claim(s) 84-93 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 August 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 1/9/06, 3/2/06
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 84-86, and 91-93, drawn to a method, classified in class 977, subclass 846.
- II. Claims 87-90, are drawn to a method, classified in class 977, subclass 847.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are directed to related carbon nanotubes. The related inventions are distinct if the inventions as claimed do not overlap in scope, i.e., are mutually exclusive; the inventions as claimed are not obvious variants; and the inventions as claimed are either not capable of use together or can have a materially different design, mode of operation, function, or effect. See MPEP § 806.05(j). In the instant case, The effect is different for the two groups, Group I produces end-derivatized single-wall carbon nanotubes, and Group II produces endohedrally-modified single-wall carbon nanotubes.

Because these inventions are independent or distinct for the reasons given above and have acquired a separate status in the art in view of their different classification, restriction for examination purposes as indicated is proper.

During a telephone conversation with Ross Spencer Garsson on 3-10-2006 a provisional election was made without traverse to prosecute the invention of Group I, claims 84-86, and 91-93. Affirmation of this election must be made by applicant in

Art Unit: 1754

replying to this Office action. Claims 87-90 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Objections

Claim 84 is objected to because of the following informalities: Part B of Claim 84 unnecessarily repeats the word at. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 84-86, and 91-93 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiura (US 5698175) in view of Iijima (Nature, Vol 363, June 1993).

Hiura discloses a method for producing end-derivatized carbon nanotubes comprising the steps of: a) providing a plurality of carbon nanotubes with at least about 100 carbon atoms; and b) reacting the carbon nanotubes with a compound that provides at least one substituent on at least one of the ends of at least a portion of the

carbon nanotubes (Abstract). At least one substituent is selected from the group consisting of alkyl; acyl; aryl; aralkyl; halogen; substituted thiol; unsubstituted thiol; substituted amino; unsubstituted amino; hydroxyl (Column 3). The derivatized carbon nanotubes are inherently soluble in some medium.

Hiura does not expressly state that the carbon nanotubes are single-wall carbon nanotubes.

Iijima discloses a method of producing single-walled carbon nanotubes (Paragraph 2). Hiura and Iijima are analogous art because they are from the same field of endeavor, namely processes involving carbon nanotubes.

At the time of invention, it would have been obvious to a person of ordinary skill in the art to form the process of Hiura to include the use of Single walled carbon nanotubes in view of the teaching of Iijima. The suggestion or motivation of doing so would have been to derivatize single-walled carbon nanotubes.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ajayan (Nature, Vol 362, April 1993) teaches the opening carbon nanotubes with oxygen and implications for filling.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Fiorito whose telephone number is (571)272-7426. The examiner can normally be reached on Standard.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on (571) 272-1358. The fax phone

Art Unit: 1754

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

James Fiorito
Patent Examiner
AU 1754

Handwritten signature of James Fiorito, consisting of the letters 'JF' in a stylized, cursive font.Handwritten signature of Steven Bos, featuring a large, stylized 'S' followed by 'Bos' in a cursive script.

Steven Bos
Primary Patent Examiner
AU 1754